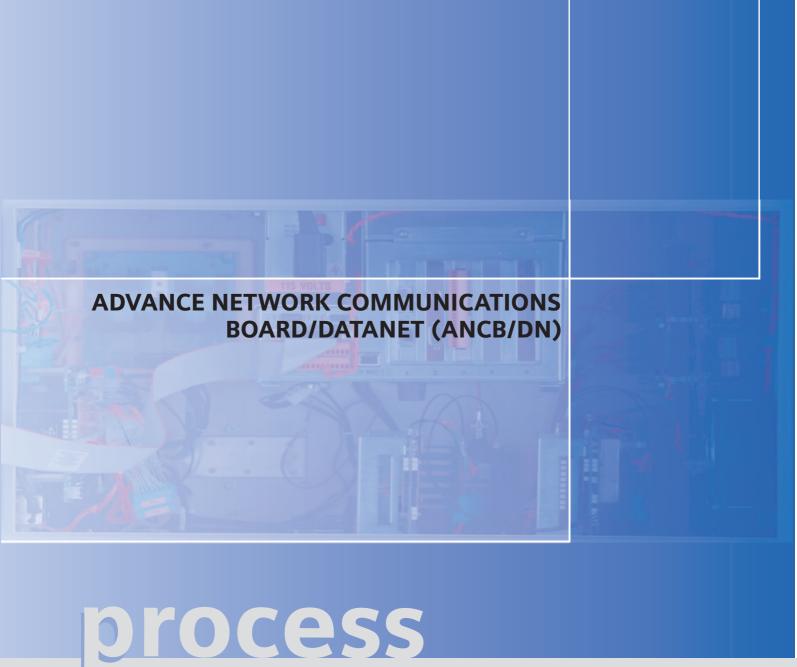
User's Manual Edition 1/2007

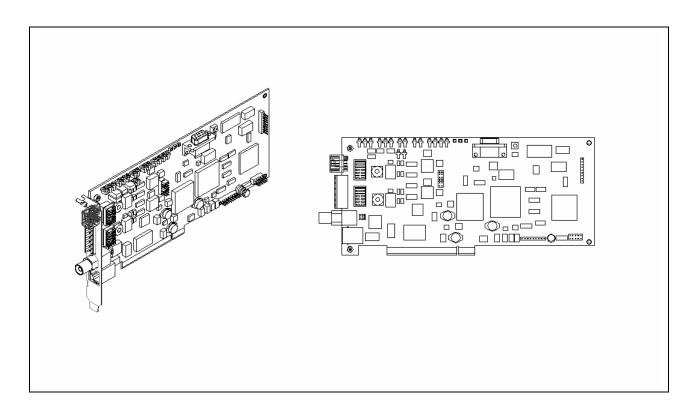


GAS CHROMATOGRAPHY

SIEMENS

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Advance Network Communications Board/DataNET (ANCB/DN)



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Houston, TX 77040

U.S.A.

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Preface

Audience & Purpose

This manual is intended for maintenance personnel and describes how to install the Advance Network Communication Board/DataNET (ANCB/DN) into an Advance Maxum™ Gas Chromatograph or Advance Network Access Unit.

Chapter Contents

The manual provides the following information:

Торіс	Page
Chapter 1. Installation	1
Chapter 2. Data Communications Setup	21
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Technical Support

Getting Help

At Siemens Energy & Automation, Inc. we take pride in the on going support we provide our customers. When you purchase a product, you receive a detailed manual, which should answer your questions; however, our technical support service provides a special "hot" line as an added source of information.

If you require assistance call:

In the United States: (800) 448-8224 Internationally: 001-918-662-7030

Before You Call

Before you call one of our technical support lines, please have the following information available to help our representative answer your questions:

- 1. Unit Serial Number and Date of Installation
- 2. Installed software version number (if applicable)
- 3. Description of problem
- 4. LEDs status on ANCB.

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Safety Practices and Precautions

Safety First

This product has been designed and tested in accordance with IEC Publication 1010-1, Safety Requirements for Electronic Measuring Apparatus, and has been supplied in a safe condition. This manual contains information and warnings, which have to be followed by the user to ensure safe operation and to retain the product in a safe condition.

Terms in This Manual

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

Terms as Marked on Equipment

DANGER indicates a personal injury hazard immediately accessible as one reads the markings.

CAUTION indicates a personal injury hazard not immediately accessible as one reads the markings, or a hazard to property, including the equipment itself.

Symbols in This Manual



This symbol indicates where applicable cautionary or other information is to be found.

Symbols Marked on Equipment



DANGER - High voltage



Protective ground (earth) terminal



ATTENTION - Refer to Manual

Grounding the **Product**

A grounding conductor should be connected to the grounding terminal before any other connections are made.

Safety Practices and Precautions, Continued

Correct Operating Voltage

Before switching on the power, check that the operating voltage listed on the equipment nameplate agrees with the available line voltage.

DANGER Arising from Loss of Ground

Any interruption of the grounding conductor inside or outside the equipment or loose connection of the grounding conductor can result in a dangerous unit. Intentional interruption of the grounding conductor is not permitted.

Safe Equipment

If it is determined that the equipment cannot be operated safely, it should be taken out of operation and secured against unintentional usage.

Use the Proper Fuse

To avoid fire hazard, use only a fuse of the correct type, voltage rating and current rating as specified in the parts list for your product. Use of repaired fuses or short-circuiting of the fuse switch is not permitted.

Safety Guidelines

DO NOT open the equipment to perform any adjustments, measurements, maintenance, parts replacement or repairs until all power supplies have been disconnected.

Only a properly trained technician should work on any equipment with power still applied.

When opening covers or removing parts, exercise extreme care since "live parts or connections can be exposed".

Capacitors in the equipment can retain their charge even after the unit has been disconnected from all power supplies.

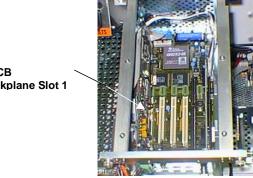
Chapter 1

Installation

Overview

Description

The Advance Network Communications Board DataNET (ANCB/DN) board plugs into the backplane of an Advance Maxum or Advance Network Access Unit (NAU) System Controller (SYSCON). All I/O wiring is made directly to the board. The ANCB/DN functions as a translator for converting signals and communication protocols. This conversion allows Advance Maxum GC's, Advance Network Access Unit (NAU) and Advance Optichrom GC's to communicate with each other via an Advance Maxum DataNET link.



ANCB Backplane Slot 1

What is DataNET

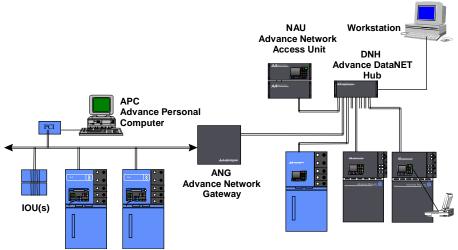
DataNET is a communications protocol that can be used in place of Ethernet for connecting all installed Maxum and Advance GC's. As compared to Ethernet, DataNET provides true network redundancy at both the hardware and software levels and uses the existing network

The DataNET link can use either copper and/or fiber optic cables. In an existing Data Hiway installation the Data Hiway cable can be used.

Installation • 1 2000592-001

Figure 1-1: Advance Communication System (ACS)

Figure 1 shows Advance Maxum and Advance Optichrom GC's communicating on an ACS via a DataNET link.



Advance Communications System

The Advance Communication System (ACS) is a high-speed communications system that uses TCP / IP protocols and addressing to interconnect chromatographs and other process analyzers in a common network. Figure 1-1 shows the Advance DataNET Hub (DNH), Advance Network Access Unit (NAU) and Advance Network Gateway (ANG) connected to the ACS. The NAU connects to the ACS and provides a method to access information coming from Advance process analyzers including Advance Maxum and Advance Optichrom GC's. The ANG is used to connect Siemens' equipment residing on an Advance Data Hiway to the ACS.

Advance Optichrom GC's

Advance Optichrom Service Panels and older APC workstations can display Advance Maxum GC information over the Gateway link. They are, however, limited to only accessing and changing basic operational status. This data includes alarms, run/hold/calibrate, view, analysis results etc.

ANCB/DN Specifications

Protocol	and	Addr	essina
----------	-----	------	--------

Open Systems standard TCP/IP protocol and addressing (Transmission Control Protocol/Internet Protocol); Full Class A, B and C addresses and subnet masking supported

Wiring Connections

- Two part connectors with screw-terminals provided for cable connection
- Fiber Optic Coupler for Fiber Optic Connections

DataNET Option, Standard Cable

- Cable connection by Belden 9182 (single pair) or Belden SSD1743 (two pairs) or equivalent; two pairs of wires are required to support redundancy
- Two pairs of cable is required to support redundancy
- Shielded cable or unshielded cable in conduit is required for conformance to CE certified installation
- Two part connectors with screw-terminals provided for field connection

DataNET Option, Fiber Optic Cable

- Fiber optics connection by 62.5 multi-mode cable corresponding to 10BaseFL Ethernet specification
- Two pairs of fibers are required to support redundancy
- Type ST mating connectors provided for field connection
- Approximately 3 mbps base transmission rate; uses dedicated transmission technique that does not require collision detection to achieve high data throughput efficiency
- Maximum Length 5000 feet (1.7km)

Fiber Optic Coupler

• Two (Tx, Rx) ST-Style Connectors (Amp type 2.5mm Bayonet)

Serial Port

 Standard RS-232 port for attachment of a laptop computer, for configuring IP Addresses and troubleshooting.

Communication Comparisons

The Table below compares key communication features between using Advance Data Hiway, Ethernet, or DataNET.

Feature	Advance Data Hiway	Ethernet	DataNET
Speed	14.2 KB/Sec	10 M baud	2. 048 M baud
Redundant	Yes	No	Yes
Number of Units in Maxum System	248	1200	1200

ANCB/DN Specifications, Continued

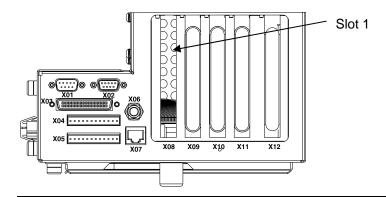
Cable Types

The following Table should be used when evaluating or selecting cable for an existing or new installation.

Cable Type	Vendors & P/N	Installation Notes
Fiber Optic MM 62.5/125; 2 Fiber Conductors	SEA P/N 1270002-002 Industry Available from Multiple Vendors	New Installation as an alternative to copper cable Max distance from Analyzer to Hub or between Hubs 1520 meters (5000 ft)
2- Conductor Copper Wire	SEA P/N 1686002-001 Belden P/N 9182 For Belden Armored Cable Order SEA P/N 1680000-002	Recommended for Single Channel Max distance from Analyzer to Hub or between Hubs 1520 meters (5000 ft)
4-Conductor Copper Wire	SEA P/N 1681000-003 Belden P/N SSD1743	Recommended for Dual Channel Max distance from Analyzer to Hub or between Hubs 1520 meters (5000 ft)
Ethernet Cat 5 Unshielded Twisted pair (UTP)	SEA P/N 1681003-006 Industry Available from Multiple Vendors	Recommended for short distances or within shelters. Max distance from analyzer to hub or between hubs 600 meters (2000 ft)

Description

The ANCB is installed into slot 1 of the Advance Maxum's or NAU's System Controller (SYSCON). To install the ANCB it is not necessary to disconnect interface cables or to remove the SYSCON from the unit.



WARNING

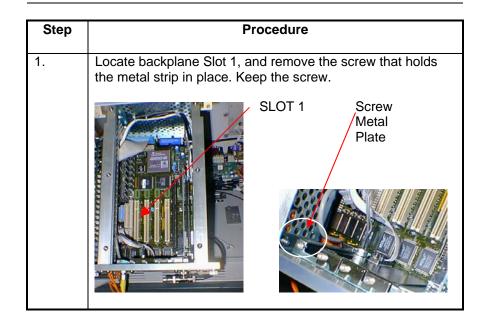


Voltage dangerous to life exists. Before performing the removal and installation procedures, it is important that primary AC power to the unit be turned off from the main circuit breaker. Observe all plant safety requirements before performing any repair or maintenance on any unit

NAU Installations

For rack mount NAU units the SYSCON connections are visible at the rear of the NAU. If you have a wall mounted unit you must first remove the front or side safety box access covers to see the SYSCON connections.

Instructions



ANCB Installation, Continued

Instructions, continued

Step	Procedure		
4.		Press the ANCB straight into slot 1. Make sure that you push evenly on both edges of the board until the ANCB is firmly seated	
5.	Secure the board to the cage with step 1.	h the screw you removed in	
6.		tor on ANCB. ERNET SSOVER	
7.	Make a selection from the following	ng Table. THEN goto	
	DataNET Copper Connections	Page 14	
	Fiber Optic Connections	Page 16	

Site Wiring Requirements

Description

The type of wiring is dependent upon the site requirements:

- CE (Conformite Europeene) Certified Areas
- NEC Division 2 or Non-Hazardous Areas
- Cenelec Zone 1 or Zone 2 Areas
- Rack Mounting Non-Hazardous Area

AC Mains Wiring

The installation should have a power disconnect external to the

enclosure.

No voltage dependent selections need to be made on the power supply,

as it has a universal input.

CE Installations See Page 11, CE Installations.

NEC Div 1, Div 2 or Non Rated Areas

Use Metal Conduit wiring method.

Conductor type: Power cable sized for circuit protection chosen.

Cenelec Zone 1 or Zone 2 Rated Areas

Use Cable Gland wiring method:

Conductor type: Power cable sized for circuit protection chosen, and

must be shielded.

Non Rated Areas or Rack Mounting Use Metal Conduit wiring method.

Conductor type: Power cable sized for circuit protection chosen.

Site Wiring Requirements, Continued

DataNET Channels

The DataNET channel connections can be either copper wire or fiber optic cable. The wiring method and cable type for DataNET is dependent upon the site requirements. For cable requirements see Table 1-1.

Table 1-1: Recommended DataNET Cable

The following Table should be used when evaluating or selecting cable for an existing or new DataNET installation.

Cable Type	Vendors & P/N	Installation Notes
Fiber Optic	SEA P/N 1270002-002	New Installation as
MM 62.5/125; 2 Fiber Conductors	Industry Available from Multiple Vendors	an alternative to copper cable
		Max distance from Analyzer to ANG or between Hubs 1520 meters (5000 ft)
2- Conductor Copper	SEA P/N 1686002-001	Recommended for
Wire	Belden P/N 9182	Single Channel
	For	Max distance from Analyzer to ANG or
	Belden Armored Cable order	between Hubs 1520 meters (5000
	SEA P/N 1680000-002	ft)
4-Conductor Copper	SEA P/N 1681000-003	Recommended for
Wire	Belden P/N SSD1743	Dual Channel
		Max distance from Analyzer to ANG or between Hubs 1520 meters (5000 ft)

Site Wiring Requirements, Continued

Table 1-1: Recommended DataNET Cable,Continued

Cable Type	Vendors & P/N	Installation Notes
Twisted Pair Copper Wire used in SEA 2100 Installations	SEA P/N C00128 Belden P/N 9462	Not Recommended for New Installations Nominal capacitance 155 pF/m (50 pF/ft.) Max distance from analyzer to ANG or between hubs 225 meters (750 ft)

Copper Wire Site Requirements

The following information pertains when using copper wire.

CE Installations

See Page 11, CE Installations.

NEC Div 2 or Non-Hazardous Rated Areas Use approved Conduit wiring method. Conduit may contain multiple cables. Adhere to all Federal and local electrical code requirements.

Cable Type: Refer to Table 1-1.

Cenelec Zone 1 or Zone 2 Rated Areas Use Cable Gland wiring method. Each cable gland allows entry of one cable.

Cable Type: Recommend Belden 9182 or armored Belden 9182 or equivalent. The proper cable gland must be used to connect the armor or shield to the enclosure. Other cables with individually shielded pairs can be used, but decreased distance is allowed (typically ~800-1000 feet for typical instrumentation cable).

Site Wiring Requirements, Continued

Non-Hazardous Areas or Rack Mounting

Use approved flexible non-metallic conduit wiring method. Conduit may contain multiple cables. For CE installations use only cable gland wiring method.

Cable Type: Recommend Belden 9182 or equivalent. Other cables with individually shielded pairs can be used, but decreased distance is allowed (typically ~800-1000 feet for typical instrumentation cable).

DataNET Fiber Optic Cable Connections

The DataNET channel connections can be either copper wire or fiber optic cable. The wiring method and cable type for DataNET is dependent upon the site requirements. The following pertains when using copper wire.

CE Installations

See Page 11, CE Installations.

NEC Div 2 or Non-Hazardous Areas

Use approved Conduit wiring method. Conduit may contain multiple cables. Adhere to all Federal and local electrical code requirements.

Cable Type: Duplex fiber, 62.5/125 micron; see Table 2-1.

<u>Connection</u>: Type ST fiber connectors. Connect these to the appropriate transmitter and receiver ports for the respective channel.

Cenelec Zone 1 or Zone 2 Rated Areas

Use Cable Gland wiring method. Each cable gland allows entry of one duplex fiber cable.

Cable Type: Duplex fiber, 62.5/125 micron.

<u>Connections</u>: Type ST fiber connectors. Connect these to the appropriate transmitter and receiver ports for the respective channel.

Non-Hazardous Areas or Rack Mounting

Use approved flexible non-metallic conduit. Conduit may contain multiple cables. Conduit may contain multiple. This method is suitable for CE installations.

Cable Type: Duplex fiber, 62.5/125 micron.

<u>Connection</u>: Type ST fiber connectors. Connect these to the appropriate transmitter and receiver ports for the respective channel.

CE Installations

Description

This section should be used for installation sites that must conform to CE (Conformite Europeene) Certification. Typically, this does not apply to installations outside the EC unless the equipment was purchased with the explicit requirements and expectations that it shall conform to EC Electromagnetic and Radio Frequency Interference (EMI/RFI) rejection specifications.

CE Installation Kit

Available from Siemens is the CE Installation Kit P/N 2020264-001. This kit has all the parts for all the installations referenced in this section.

Instructions

The following information pertains to CE Installation of General Purpose, Zone 1 and Division 2 Equipment. For Zone 1 Installations, all cabling is terminated in the ANG Zone 1 Enclosure.

Installation with Metallic Conduit

The preferred method is to route the field wiring in metallic conduit. If metallic conduit is used, unshielded power and the signal wires can be used. The power and signal wires (DataNET or Ethernet) must be routed in separate conduit.

Using flexible conduit and/or armored cable is equivalent to using "steel conduit". Flexible conduit or armored cable must have its flexible conduit and/or armoring conductivity 360-degree terminated at its entry to the enclosure (or bulkhead).

Installation without Metallic Conduit

If conduit is not used, the following installation practices must be used to ensure that the CE certification remains valid:

- 1. A shielded power cord or cable must be used for the input power wiring. The shield must be terminated at the unit in a 360-degree termination at the enclosure (bulkhead); use P/N 2015729-001 contained in the CE Installation Kit or an equivalent part. For Zone 1 Installation use P/N 1311001-014 Installation Kit.
- 2. The DataNET copper cables shields must be terminated in a 360-degree termination at the enclosure (or bulkhead; use P/N 2015729-001 contained in the CE Installation Kit or an equivalent part). For Zone 1 Installation, use P/N 13111001-014 Installation Kit.

CE Installations, Continued

- 3. A split ferrite filter must be clamped to DataNET copper wire and fixed immediately to the outside of the unit; use part number 1173000-013 ferrite contained in the CE Installation Kit. This is required to meet the Conducted Immunity requirement for CE/EMC Heavy Industrial. All other CE/EMC Heavy Industrial requirements are met without the use of a ferrite clamp.
- 4. Shielded Ethernet cable must be used for all Ethernet connections, in and outside the GC, and coupled through the enclosure using a shielded RJ-45 coupler; use part number 1183200-003 contained in the CE Installation Kit. A mounting plate (part number 2020261-001) is also available to accomplish this. If needed for Zone 1 installation, part numbers 2017984-001 and 2017985-001 is available to maintain purge. If a PG gland is used to make the 360-degree termination of the Ethernet shield at the enclosure, the Installation Kit and other parts are not required.

DataNET Connections

Description

This section provides instructions for connecting a Maxum or NAU to a DataNET network. All DataNET connections are made to the ANCB. The DataNET connections can be either copper or fiber optic cables.

Instructions

IF you are wiring for	THEN go to
DataNET Copper Connections	14
DataNET Fiber Optic Cable Connections	16

DataNET Copper Connections

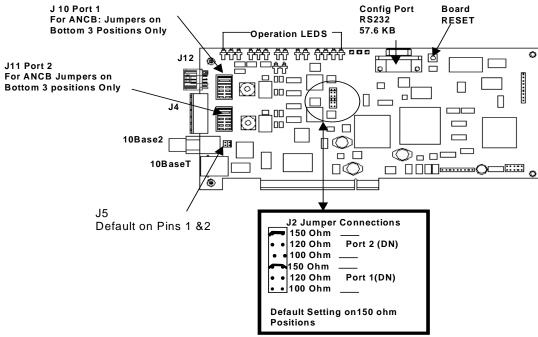
Before You Begin

This section provides instructions for connecting the Maxum to a DataNET network. All DataNET connections are made to the ANCB. The DataNET connections can be either copper or fiber.

The ingress wiring method (conduit or cable glands) and which cable type you use is dependent upon the site requirements. Review the Site Wiring Requirements page 8 to ensure that you are using the correct cable and wiring method.

Figure 1-1: ANCB Board Jumper Settings

Refer to ANCB Description page 46.



NAU Installations

For rack mount units the SYSCON connections are visible at the rear of the NAU. If you have a wall mounted unit you must first remove the front or side safety box access covers to see the SYSCON connections.

Instructions

Step	Action
1.	Turn off AC Power (Mains) to the unit.
2.	Route incoming the DataNET copper cables to the ANCB in accordance with national or local electrical codes and regulations.

DataNET Copper Connections, Continued

Instructions, continued

Step	Action			
3.	Strip the insulation ¼ -inch back from each of the incoming copper leads.			
4.	To make the connections easier we have made the ANCB port connector a removable connector. Grasp the top portion of the connector and pull it straight out from the base connector. Loosen all the top wire retaining screws from the removed connector. All connections will be made to this connector.			
5.	Connect Channel A leads to pins 1 through 3 and Channel B leads to pins 4 through 6. Tighten down the retaining screws. DataNET PORT CONNECTIONS Pin 1 + Pin 2 - Pin 3- Ground Pin 4- + Pin 5 - Pin 6- Ground			
6.	Plug Port connector back into its base.			

DataNET Fiber Optic Connections

Description



The Fiber Optic Coupler is mounted in a threaded, potted, gas tight fitting assembly designed for use in hazadrous areas when properly installed in a approved enclosure. Two Fiber Optic Couplers are required, one for DataNET Channel A and one for DataNET Channel B. The couplers are mounted through pre-drilled holes located in the top or side of the wiring acess plates or safety box.

Required Parts

All mounting hardware is supplied with the DataNET Fiber Optic parts kit. These parts are also available as spares and can be ordered from us.

Description	Part Number
Fiber Optic Coupler Assembly	2015828-001
Fiber Optics Coupler Seal Nut	N8005
Fiber Optic Coupler Cable	2020947-0011

Electrical/Mechanical Description

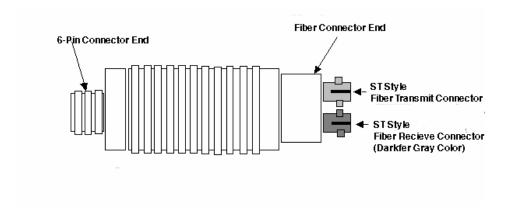
The DataNET Fiber Optic Coupler performs translation of signals between a DataNET Hub and Advance Maxum. The Fiber Optic Coupler converts between electrical signals and optical signals. The conversion is transparent to the network. Fiber Optic signals are impervious to distubances caused by electrical interference from nearby equipment, ground loops, power surges, or nearby lightning strikes.

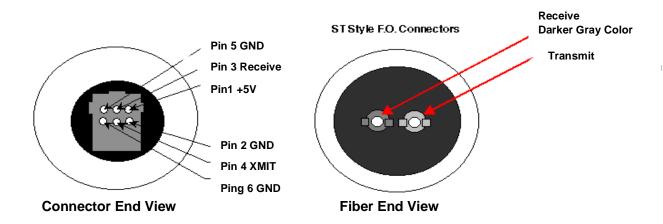
DataNET Fiber Optics Couplers can drive up to 5000 feet of fiber optic cable.

DataNET Fiber Optic Connections, Continued

Figure 1-3: Fiber Optic Coupler

The DataNET Fiber Optic Couplers use **ST-style** connectors (twist & lock). Always insure that the TX (Transmit) on one end of the link is connected to the RX (Receive) at the other end of the link. Some duplex fiber optic cables are coded to help monitor the direction of data travel. If the fibers are not coded, special attention must be paid to insure a proper connection.





DataNET Fiber Optic Connections, Continued

Installation Instructions

01	
Step	Action
1.	Ensure that the ANCB is installed in slot 1 of the SYSCON.
2.	Connect the Fiber Optic cable, 10-pin connector to J12 on the ANCB. 10-PIN FIBER OPTIC CONNECTOR
3.	Route each of the other 6-pin connectors marked J1 and J2 through the holes drilled in the access plate and connect to the Fiber Optic Coupler Assemblies. Mount the Fiber Optic Coupler Assembly using the hardware that came with it.

DataNET Fiber Optic Connections, Continued

Instructions, continued

Step	Action
4.	Connect the incoming Fiber Optic cable transmit and receive lines to the ST connectors on the assembly; see figure 1-3.
	The DataNET Fiber Optic Couplers use ST-style connectors (twist & lock). Always insure that the TX on one end of the link is connected to the RX at the other end of the link. Some duplex fiber optic cables are coded to help monitor the direction of data travel. If the fibers are not coded, special attention must be paid to insure a proper connection.

Chapter 2

Data Communications Setup

Introduction

Overview

This chapter provides maintenance personnel instructions for making the operational settings for the Advance Network Communications Board (ANCB).

Command Line **Definitions**

Review Chapter 3, Command Line Summary. Chapter 3 provides definitions for all of the commands you will be using in this chapter.

Chapter Preview

This chapter provides the following information:

Topic	Page
Configuring Your PC	22
Establishing a Connection	27
Setting Network Address	30
Assigning an IP Address	32
Firmware Updates	33

Configuring Your PC

Description

The Advance Network Communications Board (ANCB) has a built-in utility for configuring the unit. The Windows® HyperTerminal program, which resides on most PCs, can be used to access the utility. Other serial communication packages that support the following settings can also be used.

Baud rate: 57.6k baud

Data bits: 8
Parity: none
Stop bits: 1
Flow control: none

Instructions

This procedure uses the Windows Hyper Terminal program to configure your PC to communicate with the ANCB.

- 1. Click the Start button, and then click on Programs.
- 2. Click the **HyperTerminal** icon to start the Program.

Connection Description dialog box will open.



- 3. In the **Name** field, type in a Connection Name. Example: Advance Maxum ANCB.
- 4. In the **Icon** field select an Icon to represent the name selected.

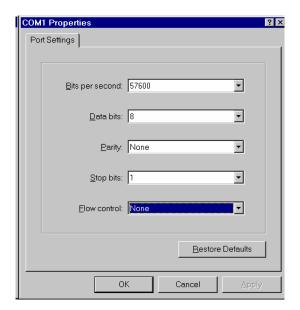
5. Click OK.

The Connect To dialog box opens.



- From the **Connect using** scroll list choose the COM port you will be using on the PC to connect to the Advance Maxum configuration port.
- 7. Click OK to save the selection.

The COM Properties box opens.



8. Scroll each field and select the following Port Settings:

Bits per second: 57600

Data Bits: 8
Parity: None
Stop bits: 1

Flow Control: None

9. Click OK.

The Main Menu will appear.

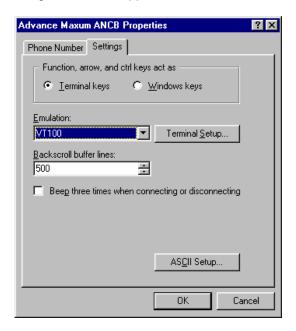
10. Click File and choose Properties from the drop-down menu.

The Advance Maxum ANCB Properties box will appear.



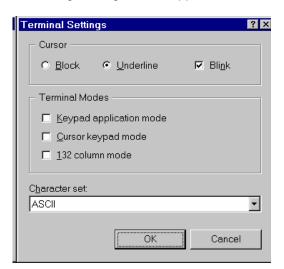
11. Click Settings tab.

The settings screen will appear.



- 12. From the **Emulation** scroll list select VT100. Do not change the default settings for the other parameters.
- 13. Click Terminal Setup button.

The Terminal Settings dialog box will appear.



14. Ensure that the following default settings are set:

Cursor:

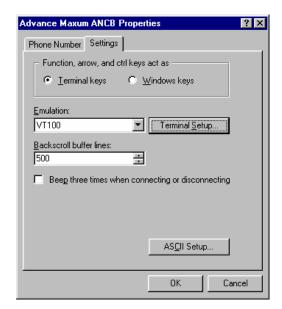
Underline

√ Blink

Terminal Mode: none Character set:ASC11

15. Click **OK**.

The **Advance Maxum Properties** box will appear dialog box will appear.



- 16. Click **OK** to return to main menu.
- 17. From the main menu select File/Save As.
- 18. Enter the short cut name. Click **Save** to complete the setup.

Your PC is now setup to connect to and configure the Advance Maxum ANCB.

To create a shortcut to the new connection you just entered and place it on your Desktop, select the file name you entered in step 18 and click the right mouse button. From the pop-up menu select **Create Shortcut**.

Once the shortcut is created it can be moved to the Desktop. Simply click the shortcut icon and drag the icon while holding down the left mouse button. Release the mouse button to place the icon.

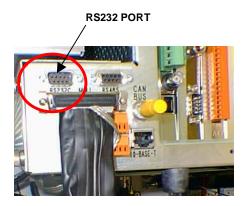
Establishing a Connection

Description

Once your PC is set up, as described in **Configuring Your PC**, you are ready to connect to the Advance Maxum or NAU to configure the ANCB.

Connect PC to Maxum

Connect a standard 9-pin COM cable from your PC COM port to RS232 Configuration Port located on the SYSCON.



Password Protection

All utility programs on the ANCB are password protected. This insures the data integrity of all configuration data and limits unwanted access of the User's network. To access any of the programs you must have a logon password. The default password is *password*.

Establishing a Connection, Continued

Password Format

A password name can consist of any combination of alphanumeric characters. The alphanumeric name must have a minimum of five and a maximum of twenty characters. The ANCB is shipped from the factory with the word "password" entered as the default password name.

How to Change Password

The user can change the password name at any time. To do this login using the current password then type: "*password stand stand*". Where the word stand is your new password entered twice to verify that it was properly entered.

How to Log Out

You may log out or close the Configuration and Diagnostic program at any time by typing **logout**. However, the Configuration and Diagnostic program will automatically log you out after five minutes.

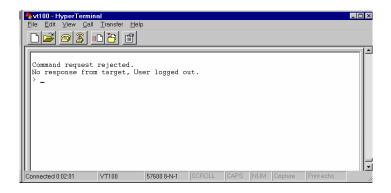
How to Log On

The following procedure assumes that a PC is connected to the ANCB Configuration port (Figure 4-1), and the PC HyperTerminal program has been configured to communicate with the ANCB; see Configuring Your PC, page 22

- 1. Open Windows HyperTerminal program.
- 2. Press

 Let Twice.

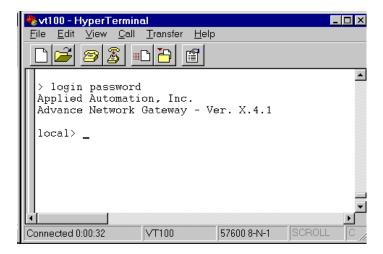
The following dialog box appears:



Establishing a Connection, Continued

3. At the > prompt type: login password and press → Enter.

The Connect Screen will appear with the login information and the local prompt. The local prompt indicates that you are communicating with the ANCB connected directly to the PC.



You are now ready to configure the ANCB, go to page 30.

Remote Connection Log On

Once your PC is connected to a network device you can connect to any other device on the same network if you know the IP address of the Maxum.

- 1. Open Windows HyperTerminal program on your PC.
- 2. Press

 Enter twice, the Command Request dialog box will appear.
- 3. At the > prompt type: login password [IP Address].

Example: login password 192.167.0.1

Once the password is verified the system responds with the login information and displays the remote prompt which includes the IP address of the connected device.

Setting Network Address

Description

This section provides instructions to configure the ANCB/DN.

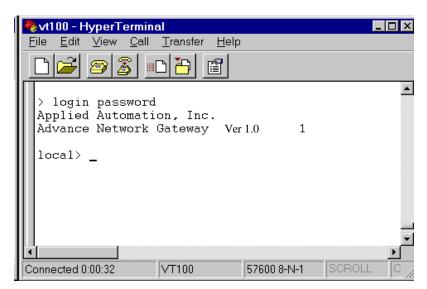
Command Line Definitions

Chapter 3, Command Line Summary, provides definitions for all of the commands you will be using in this chapter.

Instructions

- Connect a standard 9-pin COM cable from the designated PC COM 1 to the RS232 Configuration Connector on the ANCB (see Figure 4-1).
- 2. Open Windows HyperTerminal program on your PC; reference **Configuring Your PC**, page 22.
- 3. Connect and Log on to Advance Maxum ANCB; reference **Establishing a Connection**, page 27.

The Connect Screen will appear with the login information and the local prompt. The local prompt indicates that you are communicating with the unit connected directly to the PC.



Setting Network Address, Continued

Learning Hint

See Assigning an IP Address, page 32 to learn how to assign an IP Address.

4. To configure the ANCB address, at the Local > prompt type: config address ip xxx.xxx.xxx

Where xxx.xxx.xxx should be replaced with a 12-digit unique network address. See Assigning an IP (Internet Protocol) Address page 32.

- 6. The following message appears: Configuration change verified
- 7. To configure the ANCB subnetwork, at the Local > prompt type: **config netmask xxx.xxx.xxx**
- 8. Where xxx.xxx.xxx is the subnet mask for your network. Typically, this would be in the range 255.255.0.0 through 255.255.255.0.
- To configure the ip router address at the Local > prompt type: configing or iproute x

An IP router address is not always required. This command sets the address of the IP router. Your network administrator can help you choose an address.

This field can be left to the default setting of 000.000.000.000 if an IP router is not used

11. Press **→ Enter**.

This completes the necessary ANCB Configuration. To display the current settings, type at Local > prompt: *config display*

Assigning an IP Address

Overview

Each DataNET device must have a unique IP address. This 32-bit number defines each devices network ID and host ID. The IP address must be assigned by the user before the unit is network operational.

See Setting Network Address page 30, for instructions on how to enter the IP address.

IP Address

The IP Address consists of a 32-bit number divided into four 8-bit fields. Each field is expressed as a decimal number from 1 to 255 with each field separated by periods. This is referred to as "dotted decimal" notation. For example, 192.16.9.52 is an IP address.

How to Assign an IP Address

Ask your network administrator to assign you an IP Address, or if the device will be in a closed plant area and not connected to the Internet you can select an address from Table 2-1.

Table 2-1: Available IP Addresses

192.165.0.1	192.165.0.15
192.165.0.2	192.165.0.16
192.165.0.3	192.165.0.17
192.165.0.4	192.165.0.18
192.165.0.5	192.165.0.19
192.165.0.6	192.165.0.254
192.165.0.7	192.165.1.254
192.165.0.8	192.165.2.254
192.165.0.9	192.165.3.1 - 192.165.3.254
192.165.0.10	
192.165.0.11	
192.165.0.12	
192.165.0.13	
192.165.0.14	

Firmware Updates

Description

Periodically we will provide our users with firmware upgrades. Perform the following instructions to download a new firmware upgrade to the Communications board ANCB. A firmware upgrade will take approximately 5 minutes.

Instructions

The following procedure assumes that the HyperTerminal program is residing on your PC and has been configured.

- 1. Connect a standard 9-pin COM cable from the PC COM port to RS232 connector located on the ANCB/DN board.
- 2. Open HyperTerminal program on your PC; reference **Configuring Your PC**, page 22.
- 3. Connect and Log on to the Maxum.
- 4. At the > prompt type: download

You should see the following response on the screen. At this point the ANCB is ready to receive the new firmware version.



5. From the Main Menu bar click on **Transfer**.

Firmware Updates, Continued

6. Click on Send Text File.

The Send Text File dialog box will appear. Choose the directory on your PC where the ANCB files reside.

- 7. Under **Files of type** select All files (*.*).
- 8. Under **File name** type in the upgrade version file name (ANCB_DN.mot).

This will start the down loading of the files. Once the download has begun the block numbers will be displayed as they are transmitted. The upload will take approximately 5 minutes to complete.

Chapter 3

Command Summary

Command Descriptions

Description

This chapter is intended for maintenance personnel.

This chapter provides definitions for all of the commands you will be using for setup purposes or for performing test diagnostics.

Unique Commands

These are the commands that are unique to the ANCB.

config address ip	Set the ANCB IP address.
ipaddr	
config address	Set the ANCB Ethernet hardware address.
ethernet eaddr	
config display	Display the current ANCB non-volatile
	parameters.
config netmask	Set the ANCB IP subnetwork.
XXX.XXX.XXX	
config iproute	Set the default router IP address.
routeaddr	
display links	Display link state table.
hdlc setuptime	Display and/or change the hdlc setuptime in
	microseconds.
hdlc window	Display and/or change the hdlc window.
download	Download new software via Configuration port.
	'
list	List next 22 log events.
list nnn	List 22 events, starting with number <i>nnn</i> .
list nnn, xxx	List xxx events, starting with number nnn.
list on	Continuously list events from the log buffer,
	as they are added (terminate by pressing any key).
list clear	Clear all events from log buffer.
login <i>password</i>	Log in to device via Configuration port.
login password	Log in to remove device (ANCB or HUB).
remoteaddr	

logout	Log out of device.
netstat hdlc	Display DataNET link statistics for all ports.
netstat hdlc clear	Display and clear all DataNET link statistics for all ports.
netstat hdlc port# clear	Display and clear DataNET link statistics for the specified port (1 or 2).
netstat hdlc port#	Display DataNET link statistics for the specified port (1 or 2).
netstat clear	Clears the Ethernet statistics counters.
netstat pna	Display OS memory buffer statistics.
password newword newword	Change login password for ANCB.
port start port	Enable specified DataNET port (1 or 2).
port stop port	Disable (stop all activity) on specified DataNET port (1 or 2).
reset	Reset and Save Configuration data.
test port#	Place a port into hardware test mode.
test off	Take a port out of test mode.
timeout on	Enable user login timeout.
timeout off	Disable user login timeout.

config address ip

This command sets the device IP address. Each device in the system must have a unique IP address. Your TCP/IP network administrator can help you choose appropriate addresses for your network. IP addresses are entered in "dotted-decimal" notation. For example:

config address ip 192.10.6.123

The IP address is <u>not</u> automatically stored in non-volatile memory until the reset command is entered. You can display the current IP address with the config display command.

config display

This command displays the configuration parameters for the device.

config netmask

This command sets the IP subnet mask for the device. Your TCP/IP network administrator can help you choose appropriate subnet mask for your network. Subnet masks are entered in "dotted-decimal" notation. For example:

config netmask 255.255.192.0

The subnet mask is <u>not</u> automatically stored in non-volatile memory until the reset command is entered. You can display the current subnet mask with the <code>config display</code> command.

config iproute

This command sets the address of the IP router to which the device should send TCP/IP messages whose destinations do not reside on the devices' own network. Your TCP/IP network administrator can help you choose appropriate router addresses for your DataNET hubs (a router address is not required). Addresses are entered in "dotted-decimal" notation. For example:

config iproute 192.10.6.1

display links

This command displays the ANCB/DN link state table. The link state table indicates, for each link, whether or not the link is currently "up," "down," or undergoing link validation ("check"). For DataNET links, the table also gives the device to which the link connects. Devices are identified by IP address. For example:

local> display links

Uр

Port status for 172.16.9.239, Port1 - DataNET A, Port2 - DataNET B Port: Medium: Status: Connected to: 1 Copper Connected 172.016.099.003, 4A Copper Connected 172.016.099.003, 4B Ethernet

dn" Command

This command may be used to override default values for several parameters related to the DataNET protocol. Specific forms of the command are:

dn setuptime

Displays the current "setup time" value, in microseconds. This is the time that the ANCB DN board will transmit a "preamble" pattern on a DataNET link before starting the actual data frame. The preamble allows time for the receiver circuitry at the far end of the link to adjust to the incoming signal's amplitude, phase, and frequency. The default setup time is 3.5 milliseconds.

dn setuptime time

Sets the DataNET setup time to the value given, in microseconds. The new setup time value is saved in non-volatile memory.

Time is entered in microseconds. Example: 3.5 milliseconds is entered as 3500.

"hdlc" Command

This command may be used to override default values for several parameters related to the DataNET protocol. Specific forms of the command are:

hdlc setuptime Displays the current "setup time" value, in

microseconds. This is the time that the ANCB/DN board will transmit a "preamble" pattern on a DataNET link before starting the actual data frame. The preamble allows time for the receiver circuitry at the far end of the link to adjust to the incoming signal's amplitude, phase, and frequency.

The default setup time is 2500

microseconds.

hdlc setuptime time Sets the DataNET setup time to the value

given, in microseconds. The new setup time value is saved in non-volatile

memory.

hdlc window Displays the transmit "window" size used

by DataNET. This is the number of Iframes (Information frame) that a station may send before it must receive a lowlevel acknowledgment from the receiving

station.

hdlc window num Sets the transmit window used by ports 1

and 2 on the ANCB. The parameter "num"

must be a number 1 through 7. The

default window size is 7.

download

Use this command to load new software into the device via the RS-232 Configuration port. The procedure for software download is:

- 1. Make sure you have a "rom.mot" file available for download.
- 2. Log into the target Hub through the RS-232 port, using HyperTerm.
- Type "download" at the hub's prompt (">"). The hub will print with some messages and will then prompt to begin transmitting the download file.
- 4. Transmit the download file. Use the HyperTerm "Transfer --> Send Text File..." command. Find the "rom.hex" file using the browser window. You may have to select "Show all files" in the "Files of type" window to see the "rom.mot" file.
- 5. After you have selected the "rom.mot" file and click on "OK," HyperTerm will begin transmitting records to the Hub. The Hub will respond by periodically displaying addresses as the file downloads.
- 6. After about 4 minutes 30 seconds, the download will be complete. The hub will then display messages indicating that the download has completed, and it is erasing and programming the FLASH memory.
- 7. Finally, the Hub will reset, and display a new login prompt.

list

Enter the **list** command at any time from the Configuration Management interface to see event buffer messages. The list command has an internal current sequence number that is set to 1 each time a Configuration Management login occurs. The list command will show 10 messages each time it is entered, beginning with the current sequence number. The current sequence number is updated each time **list** is used. A new current sequence number can be entered with the **list** command:

local>	list 155				
msg	source	destination	size	source port	time stamp
155	Trace enabled				00:01:48.23
156	IP-172.16.9.211	IP-172.16.9.210	64	2	00:01:48.29
157	IP-172.16.9.211	IP-172.16.9.210	64	2	00:01:49.00
158	IP-172.16.9.210	IP-172.16.9.211	64	Ethernet	00:01:49.75
159	IP-172.16.9.211	IP-172.16.9.210	64	2	00:01:50.11
160	Station detected II	2-172.16.9.014			00:02:00.00
161	IP-172.16.9.014	IP-172.16.9.210	1536	5	00:02:18.29
162	IP-172.16.9.211	IP-172.16.9.210	1536	2	00:02:18.00
163	IP-172.16.9.210	IP-172.16.9.211	1132	Ethernet	00:02:19.75
164	IP-172.16.9.211	IP-172.16.9.210	64	2	00:02:20.11

The event display gives a time-stamp, and an event description. All events other than frame-capture events are always shown as single lines. Captured frames may be summarized as single lines, or expanded into a multi-line display.

Time stamps are shown as elapsed time from the last board reset or power-on.

The user can view more than 22 messages by supplying at sequence number and list length:

list 1, 300 List message numbers 1 - 300.

The list length may appear by itself:

list, 32

This lists the next 32 trace buffer entries and increments the current message number by 32.

All the messages in the internal trace buffer can be viewed by listing sequence number one then entering the **list** command until the last message is displayed. When the current message number is incremented to the last message in the internal buffer, it is automatically set to 1.

There is a continuous listing mode for monitoring all the messages in the internal trace buffer. It is set by entering **list on**. All the messages in the internal buffer will be displayed and any new messages will be listed as soon as they are collected into the buffer. Hitting any key terminates the continuous listing mode.

To clear all events from the event buffer, use

list clear

login

The login command allows the user to access all the ANCB parameters and diagnostic information. The format is:

login password Where password is the user password.

A password can contain any alphanumeric character and must be between 5 and 20 characters in length. See the **password** command for information on how to change the user password.

Users can login to a remote ANCB or DataNET HUB by first logging out of the local device and then typing:

login password xxx.xxx.xxx Where xxx.xxx.xxx is the IP address of the remote device.

logout

The logout command is used to log the user out of either the local or remote device. Note: User's will be automatically logged out after five minutes of non-activity unless the user has issued the **timeout off** command. Also the user must be logout of the local device before logging into a remote device. See the login command.

netstat

This command is used to display statistics for the DataNET, Ethernet, or OS memory buffers.

The command **netstat** hdlc displays the total statistics for all DataNET ports.

The command **netstat** hdlc1 displays the statistics for DataNET port one only.

Example:

local> netstat dn 1 DataNET Statistics for DN link 1	
Frames Sent	855
Frames Sent/Retried	0
Frames Sent/Redirected	0
Frames Sent w/ Errors	0
Frames Sent UnACKnowledged	0
Frames Received	859
Frames Receiver Not Ready	0
Frames Received w/ Errors	0
Link down	2

The command **netstat** hdlc **clear** resets all DataNET statistics counters.

The command **netstat** hdlc **2 clear** resets only the port 2 statistics counters.

password

The password command is used to change the user assigned password. The password can be any alphanumeric character and it must be between five and twenty characters in length. Example:

password newpassword

Note the newpassword is entered twice to verify that the password was entered correctly.

"port" Command

This command will enable or disable normal DataNET communication on individual ports. Before placing a port into "test" mode (see test command below), the port must first be taken off-line with:

port stop num

where *num* is a port number, 1 through 2.

port start num

Will re-start normal DataNET communications on a port.

reset

This command resets and saves the configuration parameters in non-volatile memory.

test

This command places a selected port into a hardware diagnostic mode. The test mode can be used to verify cable continuity and DataNET signal levels when used in conjunction with an Oscilloscope or other test device.

The command:

test 1

places port 1 into test mode. The device will generate poll messages on port 1 every 50 milliseconds. The other port continues to operate normally. The command:

test off

turns off test mode. Only one port at a time may be in test mode.

timeout

This command may be used to disable the user login timeout. Normally, if a user has not issued a CLI command for five minutes, the device will automatically shut down the user's login session. This command may be used to defeat (and re-enable) this timeout:

timeout off Disables timeout. The device will not automatically

log out the user; regardless of the time elapsed since

the user last issued a CLI command.

timeout on Re-enables the five-minute CLI timer.

Chapter 4

Troubleshooting

Introduction

Overview

This chapter provides installation personnel with troubleshooting information to solve problems associated in the setup of the Advance Network Communications Board.

Chapter Highlights

Before beginning the installation process read through this Chapter to familiarize yourself with the information provided.

Topic	See Page
ANCB Description	46
ANCB's LEDs Description and Operation	49
DataNET Troubleshooting Guide	52

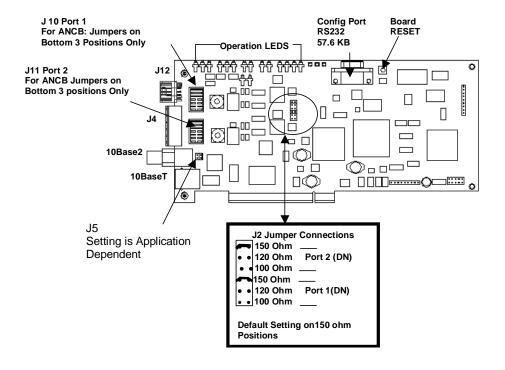
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ANCB Description

Description

The DataNET ANCB (Advance Network Communication Board) provides the communications electronics for the unit. The ANCB plugs into the slot 1 of a Maxum or NAU System Controller Unit (SYSCON) located on the power supply assembly. A bracket fastens it to the chassis. The ANCB is factory set and programmed either for DataNET or Ethernet operation (ANCB/DN or ANCB/EN).

Figure 4-1: ANCB Board



J10 &J11 Connections

Jumpers J10 & J11 select the ANCB/DN network interface provided to connector J4.

Jumper J10 connects Port1 (pins 1-3) on J4 to either the Optichrom Data Hiway or the Advance DataNET Channel A interface. Jumper J11 connects Port 2 (pins 4-6) on J4 to either the Optichrom Data Hiway or the Advance DataNET Channel B interface. Jumpers J10 and J11 is factory configured in accordance with the ANCB type (DataNET or Ethernet).

Connector J12

Connector J12 is used to connect the ANCB ports to an Advance DataNET Fiber Optic network using Advance Fiber Optic Couplers.

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ANCB Description, Continued

Jumper J2 Settings

The ANCB provides a set of impedance matching jumpers to simplify the cable interfacing process. Jumper J2 is a six-position header used to select the proper cable impedance matching circuit for each ANCB DataNET port. Jumper J2 is logically partitioned into two groups of three positions, see Figure 4-1. There are two jumpers provided on J2. The lower jumper configures Port1 and the upper configures Port2. Each jumper can be placed in one of three positions, see Figure 4-1. The three positions match cable impedance of 100, 120, and 150 ohms. If the characteristics of the cable you are using are unknown check with the cable manufacturer for the resistance setting. The manufacturer's name is usually printed on the cable cover.

Connector J5

Connector J5 is the impedance matching jumper for the 10Base2 (BNC) connector labeled P1 on the ANCB board. The connector is a 2-position (4-pin) connector. Pin 1 is denoted by a dog-ear that is silk-screened in a rectangle near J5. The pins are numbered 1 to 4 in the clockwise direction.

Impedance termination for Ethernet 10Base2:

End point devices should be terminated with a 50-ohm resistor.

Devices that are not on the end point require no termination resistors.

When the 10Base2 connector is not in use (i.e. no cable connected) the connector should be terminated with a 25-ohm resistor to prevent spurious errors from being generated on the 10BaseT connector. This is necessary since both the 10Base2 and 10BaseT connectors are connected to the same Ethernet Hub chip on the ANCB board.

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ANCB Description, Continued

Jumper J5 Settings

The ANCB jumper settings for J5 are factory set and dependent upon the product the ANCB will be used in.

Product Type	ANCB J5 Jumper Settings
Advance Network Gateway Ethernet (ANG-EN)	Pins 3&4 are shorted, switch in 25- ohm position. 10Base2 connector is not normally used (not connected)
Advance Network Gateway DataNET (ANG-DN)	Pins 1&2 are shorted, switch in 50- ohm position. 10Base2 connector is used as an end point for crossover cable.
Advance Plus Analyzer	Pins 1& 2 are shorted, switch in 50- ohm position. 10Base2 connector is used as an end point for crossover cable.
Maxum Analyzers with ANCB/DN Installed	Pins 3&4 are shorted, switch in 25- ohm position. 10Base2 connector is not normally used (not connected)

More Information

See ANCB LEDs Description and Operation, page 49.

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ANCB LEDs Description and Operation

Description

This section provides maintenance personnel with information on how to use the ANCB LEDs for troubleshooting the Advance Network Communications Board.

Communications Board LEDs

Refer to Figure 4-2 for LED position and labeling.

Power-UP

At power-up the top row of LED indicators will blink on briefly as the board passes its various power-up sequence tests. The ADHA green light indicates that the initial program parameters were successfully moved from FLASH to RAM memory. The ADHA yellow LED indicates that the board has passed its power-up RAM test, the ADHA red LED indicates that the board has passed its power-up FLASH integrity test, and the ADHB green LED indicates the board has begun its normal program execution. After approximately 5 seconds the indicators will go off depending upon the current board conditions.

Normal Operation

In normal board operation the ADHA LED's are used to indicate the status of the Data Hiway channel and the DNETB LED's indicate the status of the DataNET channel. In normal operation the ADHA green LED blinks to indicate either transmit or receive activity has occurred on the Data Hiway channel. The yellow LED will blink to indicate any transmit or receive errors that have occurred.

The DNETB LED's provide a link status indication for the DataNET channel. If the DataNET link is up and communicating the DNETB green LED will be lit. If the link is down or in the process of establishing a connection the DNETB red LED will be lit.

Board Fault Indicators

If the ANG/DN board has a power-up failure or other catastrophic failure during normal operation the red Fault LED will light to indicate that a fault has occurred and the yellow LED will blink an error code, see Table 3-1 Error Codes.

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ANCB LEDs Description and Operations, Continued

Figure 4-2: ANCB/DN LED Indicators

Figure 4-2 shows the edge visible LEDs on the ANCB. The LED labels are silk-screened adjacent to each LED on the ANCB.

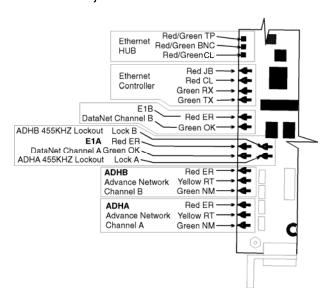


Table 4-1: Error Codes

Use the following Table 4-1 to determine the error condition. FAULT errors can only be cleared with a board reset.

NUMBER of Blinks	Type of Error	Corrective Action
1	RAM FAILURE	Replace Board
2	FLASH FAILURE	Reload Firmware or Replace Board
3	ETHERNET FAILURE	Replace Board
4	DataNET FAILURE	Replace Board
6	DUPLICATE IP	Change Board IP address
8	WRONG LOOP	Change Loop Number
9	WRONG JUMPER CONFIGURATION	Check J10 and J11 Connections
10	DUPLICATE UNIT NUMBER	Change Unit Number

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ANCB LEDs Description and Operations, Continued

ANCB Ethernet Controller LEDs

Each ANCB provides two Ethernet ports a 10BaseT and 10Base2. Each port is connected directly to an onboard Ethernet hub. The three LED's labeled HUB in figure 4-2 (CL, BNC, TP) is the status indicator for this internal hub. The Hub LED's are bi-colored LEDs and require careful observation of both the color and blink rate to determine the device status. Table 4-1 describes the color and blink rate to determine device and port status.

The on-board Ethernet controller provides four status LED's in Figure 4-2. (Tx, Rx, CL, JAB) The Green TX LED blinks whenever a message is transmitted on the Ethernet channel. The Green RX LED blinks whenever a message is received on the Ethernet channel. The Red CL LED indicates there was a collision on the Ethernet. Note: collisions are a normal occurrence on an Ethernet network. However, excessive collision's can be indication of a potential problem on the Ethernet. The Red JAB LED indicates that the Ethernet controller has determined that the transmitter has remained on for longer than allowed and indicates a possible hardware failure.

10BaseT/10Base2 Ethernet LED

CL Steady Green indicates a FIFO error Steady Red indicates a Collision on the HUB ports (Receiving on one port while transmitting another)

BNC Blinking Red indicates a packet is being transmitted. Blinking Green indicates a packet is being received. Alternating Red/Green indicates the 10Base2 port is Partitioned Out (Disabled).

TP Steady Green indicates the 10BaseT port is receiving the Link Integrity Pulse (Keep Alive signal)
Blinking Red indicates a packet is being transmitted.
Blinking Green indicates a packet is being received.
Steady Red indicates the Polarity is reversed on the 10BaseT port.

Alternating Red/Green indicates the 10BaseT port is

Alternating Red/Green indicates the 10BaseT port is Partitioned Out (Disabled).

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DataNET Troubleshooting Guide

Instructions

If a DataNET communications link fails to establish check for a:

- · configuration conflict,
- link signal quality problem.

Configuration Conflicts

If the ANCB_DN port DNETA or DNETB LED is never green, or intermittently flashes between green and red, a configuration conflict exists. Configuration conflicts can be caused by cabling or improper software configuration parameters.

Cable Connected to Wrong Hub or Port

Verify that the Channel A DataNET link is connected to the A Hub half and that the Channel B DataNET link is connected to the B Hub half. Verify that both Channels A & B utilize the same port number on their respective Hub half. Then display the Port Status screen by connecting a PC to the Configuration Port, logging in, and typing *display links*. Verify that the two Ports are connected as expected.

Example

The following example shows that port #1 (DataNET Channel A) is connected to the DataNET Hub whose IP address is 172.016.099.003 on port #4, Hub half A and port #2 (DataNET Channel B) is also connected to the DataNET Hub whose IP address is 172.016.099.003 on port #4, Hub half B.

local> display links

Port: Medium: Status: Connected to:
1 Copper Connected 172.016.099.003,4A
2 Copper Connected 172.016.099.003, 4B
Ethernet UP

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DataNET Troubleshooting Guide, Continued

Configuration Parameter Errors

The device may have an invalid or duplicate IP address, Subnet mask or iproute. Each ANCB must have a <u>unique</u> IP address. Verify the configuration parameters by connecting a PC serial port to the Configuration Port, Logging in and typing *config display*.

local> config display

Config:

Device ANCB_DN
address ip 172.16.9.239
netmask 255.255.0.0

address ethernet 00.c0.c9.00.d2.3b

iproute 0.0.0.0 time server ip 0.0.0.0

port1 DataNET Copper port2 DataNET Copper

Device ID

The ANCB/DN device id is automatically assigned and is not user configurable as it is on the DataNET Hub. Th ANCB/DN device ID is automatically set to the board IP address at power up or reset. :

Broadcast Status Information

The Advance Network device periodically broadcast their status for diagnostic and network routing purposes.

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DataNET Troubleshooting Guiding, Continued

Signal Quality Problems

If the ANCB_DN port LED is never green, or intermittently flashes between green and red, there may be a signal quality problem. Signal levels should be examined to determine if a particular port has a signal too large or too small relative to the other ports on the HUB. If a link fails to connect at all, place the port in a test mode which will cause activity to occur every ~50 milliseconds instead of every ~5 seconds as on an unconnected link.

Placing Unit in Test Mode

To place the unit in a test mode use the CLI commands to take the link offline (port stop n) and initiate the test mode (test n). At this time, an oscilloscope may be taken to the site of the slave device and connected to monitor the signal. The signal received at the slave should be between $\sim 0.75 \text{ v p-p}$ and 5 v p-p. A signal smaller than $\sim 0.75 \text{ v p-p}$ is generally not adequate. The impedance matching jumpers can be changed to correct some signal level issues.

If the condition of excessive signal loss can not be corrected by jumper settings, it may indicate inadequate cable properties (i.e. too long or wrong type of cable).

The port can be taken off test mode and put back to normal operation with the "test off" and "port start *n*" commands.

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Chapter 5

Parts Catalog

Introduction

Overview

This chapter is intended for maintenance personnel.

The Chapter provides a list of replaceable parts and assemblies for the Advance Network Gateway with DataNET option. Subsequent information includes how to remove and replace the replacement part or assemblies.

How to Place an Order

Parts can be ordered from:

Siemens Energy & Automation, Inc. 408 US Highway 60 Bartlesville, Oklahoma 74003

Tel: (800) 448-8224 (USA)

Tel: 001 918-662-7030 (International)

Fax: (918) 662-7482 (USA) Fax: 001 918-662-7482

To ensure an immediate response to your request, you should provide the following:

- Purchase order number. If ordering by phone, a confirming P.O. should be sent.
- Address where the parts are to be shipped.
- Address where the invoice is to be sent.
- Part numbers as listed.
- Quantity needed of each part.
- Equipment Serial number or project number of the system (especially for warranty related orders).
- Preferred method of shipment.

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Available Parts

Description

The following spare parts are available.

Part Description	Ordering Number
ANCB Communication Board; DataNET	2020951-004
Cable, 10Base2, 2 Ft., 90 degree BNC/ 90-degreee BNC	1681011-014
Cable 10BaseT Crossover, 6-inch	1681011-022
Fiber Optics Coupler Assembly	2015828-801
Cable DataNET Fiber Optics to ANCB	2020947-001
Cable Clamp 1/4-inch dia. Nylon Black	C55004

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Glossary

Definitions

Overview

This section defines important Terms.

Advance Network Gateway Ethernet

The Advance Network Gateway Ethernet (ANG_EN) is a wall- (or rack-) mounted unit that is self-contained with power supply and all electronics. It provides internal field termination points to connect standard Advance Data Hiway cable "on one side" and Ethernet 10BaseT cabling (Unshielded Twisted Pair) "on the other side". The Gateway unit requires 120 VAC power wired directly to it.

Ethernet

A data link level protocol comprising the OSI model's bottom two layers. It is a broadcast networking technology that can use several different physical media, including twisted-pair cable and coaxial cable. Ethernet usually used CSMA/CD. TCP/IP is commonly used with Ethernet networks.

Collisions

The result of two or more LAN stations attempting to use the same transmission medium at the same time. Collisions are a normal occurrence on Ethernet. A properly functioning Ethernet will experience a relative small percentage of collisions. Typically the collision rate should be less than 5% of the available bandwidth. Most collisions occur during the preamble portion of the frame. Most Ethernet controllers automatically retry, up to 15 times, any packet that has a collision during transmission. (Except for Late Collisions)

CRC - Cyclic Redundancy Check CRC is a method to detect errors. A number is derived from the data that will be transmitted. By recalculating the CRC at the remote end and comparing it to the value originally transmitted, the receiving node can detect errors.

DataNET

The name "DataNET" is used to mean the high-speed communication system inclusive of our application software.

Data Hiway

The term "Data Hiway" refers to the Advance Optichrom Network. The Advance Network Gateway and DataNET Gateway are used to bridge the Advance Optichrom network and the Advance DataNET network.

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Definitions, Continued

Late Collision

A Late Collision is one that occurs after the first 64 bytes in a frame or packet. Since the smallest Ethernet frame (packet) is 64 bytes in length, late collisions will not be detected on small packets. Ethernet controllers do not retransmit packets with late collisions resulting in lost packets. Late Collisions usually appear as a bad FCS frame. The only time a late collision can be detected on a 10BaseT network is when the detecting device is transmitting at the same time.

FCS - Frame Check Sequence Error

The CRC (Cycle Redundancy Check) remainder transmitted at the end of a frame. A FCS error is a legal sized Ethernet frame with a bad frame check sequence.

Ghosts

Ghosts are energy on the cable that appears to be a frame, but does not have a valid beginning of frame pattern (start delimiter 10101011). Ground loops and other wiring problems cause some repeaters to believe that a frame is being received. Since the repeater is only reacting to an AC voltage riding on the cable, there is not a valid frame to pass along. The repeater, however, transmits this energy along the network. This may be a jam pattern or a very long preamble. Ghosts events consume bandwidth and can slow down a network. Ghosts are the result of network elements reacting to noise. The effect of noise on network wiring is indeterminate. Some network devices will react while others will not. Ghosts cause random events and can be hard to correct.

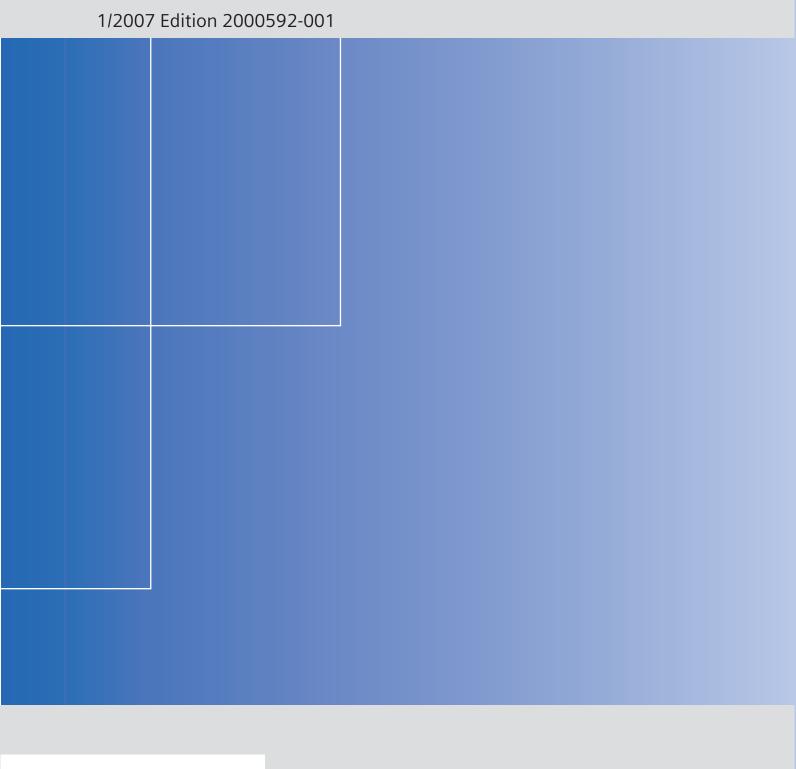
Jabber

The term Jabber refers to an Ethernet frame that is greater than the maximum legal size (Greater than 1518 bytes). Many 10BaseT HUBS will partition a port that is jabbering.

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